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ABSTRACT

Implementation of an Acquired Immune Deficiency Syndrome (AIDS) education program in Oklahoma is briefly outlined in the areas of the state mandate, local implementation, teacher training, parent meetings, and short and long courses. A study of the level of student knowledge about AIDS before and after instruction is described. Subjects were 7,145 students, grades 5 through 12, in a large inner city school system. Pretesting with a locally developed instrument indicated a fairly strong knowledge base prior to instruction. Instruction time varied from three to five class periods depending on grade level. Posttesting showed the majority of students had increased knowledge, particularly in the areas of causes, means of transmission, and authoritative sources of information. However, there was evidence of lingering misconceptions. Appended are 20 references and two tables (percentage of students mastering each objective on pretest and posttest and questions that fewer eighth-grade students answered correctly on posttest.) (Author/SI)

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A Local School District Implements a State Mandated Instructional Program on AIDS Prevention

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Abstract

Students' levels of knowledge about acquired immune deficiency (AIDS) before and after a state mandated educational program were analyzed. Subjects were 7,145 students, grades five through 12, in a large inner city school system. Pretesting with a locally developed instrument indicated a fairly strong knowledge base prior to instruction. Instruction time varied from three to five class periods depending on grade level. Posttesting showed the majority of students had increased knowledge, particularly in the areas of causes, means of transmission, and authoritative sources of information. However, there was evidence of lingering misconceptions (e.g., equating having the virus with having the disease). Program teachers indicated general approval of the program and materials but some noted the short instructional time as a problem.

A Local School District Implements a State Mandated Instructional Program on AIDS Prevention

Acquired immune deficiency syndrome (AIDS), unheard of ten years ago, now has a reported incidence of over 82,764 cases in the United States (Oklahoma State Department of Health, 1989). Of particular concern to professionals working with children and teenagers is the prediction that the spread of AIDS will increase sharply among children due to the presence of the virus in many females of childbearing age (Raper and Aldridge, 1988). A related concern is that over half of today's teens are sexually active and sexually illiterate (Hinch, 1988; Wattleton, 1988; Scott et al., 1988; Bennett, 1988).

Some members of the medical profession believe that successful control of AIDS depends on the ability to modify sexual behavior through public education (Cameron, 1986; Koop, 1987). A recent national survey of superintendents revealed almost unanimous agreement (98%) that AIDS education programs should be included in school curriculum (Keough and Seaton, 1988). Further, public health professionals and educators stress the importance of training all classroom teachers to respond

appropriately to students' questions (e.g., Raper and Aldridge, 1988; Hinch, 1988).

By January 1988, 10 states had mandated AIDS prevention education and 26 states had some curriculum materials dealing with AIDS (Reed, 1988). Oklahoma, even though it has a relatively low incidence of cases (122.6 reported per million people compared with a national average of 359.7; Oklahoma State Department of Health, 1989), was among the first to mandate preventive education in the schools.

Evidence of the effectiveness of AIDS education is as yet sparce in the literature, although some have reported modifications in behavior by homosexual and bisexual men (McKusick et al., 1985). However, studies of sex education for teens indicate its impact is not significant (e.g., Fisher, 1983; Onyehalu, 1983; Dembo and Lundell, 1979). Scott et al., (1988) suggest that such education can be made more helpful if students' prior knowledge is evaluated and instruction is customized. Others (Dembo and Lundell, 1979; Fisher, 1983) suggest that the lack of knowledge about sexual matters among young people, even after instruction, may be related to their use of denial in an anxiety-laden area. They stress the need to address this denial

by using desensitization techniques to reduce anxiety among adolescents in sex education classes, while Levy (1988) noted the need for teachers to overcome their own discomfort.

The purposes of this paper are to briefly outline initial implementation of an AIDS education program which addresses some of the above concerns, and to describe the level of student knowledge about AIDS before and after instruction.

Program Description

The State Mandate

In February, 1987, the Oklahoma legislature called for AIDS prevention education which would be limited to discussion of the disease, its spread and prevention (White et al., 1987). Students would receive instruction at least once during grades five through six, once during grades seven through nine, and once during grades 10 through 12. The State Department of Education (SDE) would develop curriculum and materials in conjunction with the State Department of Health (SDH). Local districts could use state developed materials or develop their own. Locally developed materials would be reviewed by the SDH for medical accuracy. All curriculum materials would be made available to parents and guardians for inspection, and no student would be

required to participate.

Local Implementation

Oklahoma City Public Schools, one of two large urban districts in the state, with a student population of approximately 38,000, first implemented its AIDS education program during school year 1987-88. The overriding goal was to help students acquire knowledge to protect themselves from infection and disease. Program planners were curriculum and school health experts. The district curriculum plan stressed that instruction would occur in a sensitive, open, and respectful environment and that students would experience mutual respect, a lack of criticism and freedom to remain silent.

Teacher training. Consistent with the recommendations of Raper and Aldridge (1988) and Hinch (1988), general information about AIDS was made available to all teachers through regional meetings. This was expected to increase their knowledge and comfort level for responding to student questions. Teachers were encouraged to explore their own feelings about the disease and about students who are infected with the virus. Fifth grade classroom teachers and Science teachers for grades eight and 10, designated as AIDS instructors, attended an additional day of

preparation. The majority of the time was spent learning medical aspects of the disease with some time spent on ways to present the information.

Parent meetings. A preliminary meeting for parents was held at a centrally located high school to coincide with the airing of an AIDS awareness program on public television. Parents were given an opportunity to hear local experts speak and to review the planned instructional materials. Following that, individual schools held similar meetings.

Short courses. A short introductory course consisting of three class periods was planned for grade 5 (hereafter referred to as Young), grades six and seven (referred to as Mid), and grades 9, 11, and 12 (referred to as High). This short course was planned for the first year of the curriculum only to ensure that all students had an opportunity to gain critical information about AIDS. As a result of this instruction, students would be expected to define AIDS, and identify causes, means of transmission, methods of prevention, and some misconceptions. Instruction for Young occurred in regular classrooms. Mids and Highs were instructed in large group assembly sessions led by teams of nurses, counselors, home economics teachers and science

teachers. A locally designed curriculum included guidelines and ground rules for class discussion, background information to dispell myths, and activities to help students become wise decision makers, develop refusal skills and stay healthy while growing up. Locally developed materials (Steller, 1987) and materials provided by the SDE (Folks and Leavitt, 1988) were used.

Long courses. Because grades 8 and 10 are pivotal years for adolescents in terms of awareness and decision making about their sexuality, more in-depth instruction consisting of five sessions was planned for these grades. In addition to the objectives for the short courses, eighth grade students were expected to gain information about the history and origins of AIDS, high risk groups, and authoritative sources of information. Grade 10 students were expected to meet all the above objectives plus know forms of the disease, diagnostic tests, and its effect on pregnant women. Grade 8 students were instructed in science classes and Grade 10 in biology classes. In addition to the curriculum previously described, teachers could choose to use the Merrill Wellness Series, AIDS, What You Should Know (Meeks and Heit, 1988).

Method

Subjects

An attempt was made to instruct most students in grades 5 through 12. Bilingual and special education students who normally attended classes where the programs were presented, were included.

Instruments

Three multiple choice instruments were developed locally by curriculum specialists (Steller, 1987) for pre and post testing. A fifty item quiz addressed the objectives for Grade 10. A forty item quiz was developed for Grade 8, and a fifteen item quiz measured Young, Mid, and High objectives. The same questions were used pre and post with the order of the questions and options being changed for the posttest. Many of the same items appeared on all three tests. Following the recommendation of Scott et al. (1988), teachers were instructed to administer the pretest, then score students' answers using stand alone scanners (NCS, Sentry 2050) available in the schools. Feedback on students' level of knowledge was to be used in adjusting instructional content to their needs. Following the posttest, teachers could again scan students' tests, for immediate

feedback, then send the tests to the central computer for aggregation.

A locally developed teacher survey was mailed to all program teachers to obtain views regarding the appropriateness of the materials and time constraints. Responses were to be identified by grade level only. Program administrators were interviewed informally.

Analysis

Because only those students receiving the AIDS instruction were pre and post tested, the analysis was limited to descriptive statistics including the percentage of students who mastered course objectives before and after instruction, and the percentage of students who showed any pre-post improvement. Mastery was defined as 80% of the items on a objective; this followed the general rule used by the district to evaluate academic criterion referenced tests. Item p values were examined to reveal specific areas of difficulty. Additionally, posttest performance of each group was analyzed to determine those objectives on which the level of knowledge was particularly high or low compared to their own performance on the other objectives. This was done by computing a mean and standard deviation across

objectives for each group and evaluating each objective against that mean in terms of one standard deviation above or below. Responses to teacher surveys were also aggregated.

Results

Parent Meetings

Administrators reported that the central meeting attracted approximately 1% of the district's parents. It was believed, after the fact, that the event had not been publicized well enough. Parent participation in individual school meetings varied from school to school. Program planners believed that meetings at this level were the most useful. The most common question asked by parents was about the explicity of the material. Approximately 1% of district parents objected to the materials (usually for moral and religious reasons) and asked that their children be exempted from instruction.

Test Results

Due to a misunderstanding of instructions, many students' pre and post responses could not be matched, resulting in a large amount of unusable data. Further, examination of the placement of responses on student's papers revealed that some students had bubbled responses in spaces for which there was no option (fewer

than 100 tests were deleted because of this). The final numbers of students at each grade level and the percent of enrollment which they represent are shown in Table 1. Sample sizes ranged from 26% of the Mid population to 59% of Young.

Validity and Reliability

The instruments were not piloted. Medical experts reviewed the questions for content validity. Pretest reliabilities, using KR-20, (Crocker and Algina, 1986) for the 15 item test were .49 for Young, .64 for Mid, and .77 for High. Posttest reliabilities for the same test were .71 for Young, .79 for Mid, and .82 for High. Reliabilities for the 40 item test were .78 and .91; and for the fifty item test, .97 and .95.

Short Course Outcomes

A majority of students in all three grade levels (80% of Young, 88% of Mid, and 59% of High) demonstrated a gain in knowledge from pre to post.

The majority of Young demonstrated mastery (80% correct) on three of five objectives prior to instruction. Those objectives had to do with causes (55% mastered), transmission (63%), and methods of prevention (69%). Following instruction, as seen in Table 1, the majority mastered all five objectives; the percent

of students mastering ranged from 54% for misconceptions to 83% for causes. On pretest, a majority of Mid also mastered causes (68%), transmission (77%), and methods of prevention (74%). Post instruction mastery was shown by large majorities on all five objectives (from 70% for misconceptions to 87% for means of transmission). A majority of High, on pretest, mastered all five objectives; causes (77%), transmission (84%) and methods of prevention (84%), definition (53%), and misconceptions (66%). The majority mastered all objectives on posttest with percentages from 73% for misconceptions to 88% for transmission.

Table 1 about here

Item by item analysis, to reveal areas of difficulty, showed the percentage of Young, Mid and High who knew that everyone who gets the AIDS virus does not develop the disease was low before instruction and not much higher after (33%, 34%, and 56% on posttest). Following instruction, fewer students said that AIDS can be prevented than before (Young, 76% pre and 61% post; Mid, 77% pre and 69% post; High, 83% pre and 77% post). A high percentage of all groups knew the disease is fatal on both

pretest and posttest (Young, 75%, and 85%, Mid, 82% and 87%, High, 88% and 86%) but the proportion of High was lower on posttest. Prior to instruction, most Young and Mid believed that AIDS stands for acquired intercourse disease syndrome (70% to 85%). On posttest, most (76% to 89%) gave the correct definition.

In terms of posttest strengths and weaknesses (defined as one standard deviation above or below the group mean) Young, Mid and High showed low ability to recognize misconceptions (54%, 70% and 73% respectively). The Young group was high in ability to identify causes (83%), while Mid and High were above high in means of transmission (87% and 88% respectively).

Grade 8 Outcomes

Overall, 79% of eighth graders showed a gain in knowledge from pre to post. The majority of students demonstrated mastery of two of eight objectives on pretest (causes, 80%, and authoritative sources, 61%). Posttest mastery was apparent for six of the eight (history and origins, 52%; definition, 76%; methods of prevention, 63; causes, 87%, high risk groups, 68%; sources of information, 70%).

Item analysis showed that after instruction, a small majority (51%) knew, that not every who gets the AIDS virus develops AIDS. This is consistent with findings for Young, Mid and High. There were several items for which fewer Grade 8 students gave correct responses on posttest than on pretest. These results are shown in Table 2.

Insert Table 2 about here

Grade 8 students were particularly low (one standard deviation below the group mean) on transmission (40%) and misconceptions (42%). They were high (one standard deviation above) in ability to identify causes (87% mastery).

Grade 10 Outcomes

In terms of overall knowledge, 79% of the 10th grade students showed pre-post gain. Before instruction, the majority of students demonstrated mastery of only two of eleven objectives (effect on pregnancy, 56%, and authoritative sources, 59%). Following instruction, the majority had mastered five (causes, 80%; methods of prevention, 61%; forms of the disease, 55%; authoritative sources, 73%; effect on pregnancy, 72%).

Knowledge of the history and origin of AIDS was particularly low on pretest (1%) and posttest (14%) as was definition (15% and 39%). Three specific questions showed fewer students responding correctly on posttest. One dealt with tests for the AIDS virus (pre, 11% correct and post, 9%). Another asked if children born of women with AIDS always get the disease (pre, 26%; post, .25%), and the third asked if AIDS is contageous; 60% responded correctly on pre and 57% on post.

Tenth graders were one standard deviation below their group mean in knowledge of history and origins (14%), and although the percent mastering misconceptions was above the criterion of one standard deviation, their performance was low on that objective (36%). Knowledge of authoritative sources of information (73% mastery) and effect on pregnancy (72%) were flagged as strengths.

Teachers' Survey

Sixty-six of 216 teachers responded to the questionnaire for a 31% return rate. Program planners felt, after the fact, that the survey had been distributed too near the end of the school year (May 25th). Of the respondents, 26% were Grade five teachers; 20% were Mid; 9% were Grade 8, 39% were nine through 12, and 6% were not identifiable. The amount of time spent

teaching AIDS prevention ranged as follows, one hour (7 teachers), two hours (9 teachers), three hours (16 teachers), four hours (4 teachers), five hours (7 teachers), six hours (3 teachers), seven hours (3 teachers). Asked to rank the total effectiveness of the program, 16% indicated 'excellent', 41% said 'very good', 37% said 'good', 6% said 'fair' and 0 said 'poor'. The biggest problem teachers reported was misunderstandings about testing.

Ninety one percent (91%) of respondents agreed or strongly agreed that written materials and videos were clear, age appropriate, kept students' attention and were, in general, helpful. Eighty eight percent (88%) thought it was appropriate for science teachers to do AIDS instruction; 84% felt materials had been disseminated in an effective manner. A low percentage (58%) agreed that time allocated for teaching was sufficient. Some teachers (11%) felt uncomfortable with the subject matter and preferred that a health volunteer be brought in; some (9%) indicated further need for all teachers to be inserviced on how to answer students' questions.

Discussion

The purpose of this study was to explore the level of student knowledge about AIDS before and after instruction. Analysis of pretest results indicates that these students had a fairly good knowledge base coming into the program. The fact that all groups of students demonstrated increased knowledge immediately after instruction should provide encouragement for legislators, local educators and health officials who view public education as important in the control of AIDS. Given that the overriding goal of the Oklahoma City Public Schools program was to give students information that will enable them to protect themselves from disease, it should be noted that students, after instruction, showed a particularly high level of knowledge about causes of AIDS and means of transmitting the disease. And although there is a need to further clear up some misconceptions, students showed knowledge about appropriate sources of information.

However, knowledge of risk does not always precipitate behavior modification, as demonstrated by wide spread seat-belt disuse and alcohol consumption. The real challenge to educators may be to improve the response of young people to known health hazards. As pointed out by other researchers, (Dembo and

Lundell, 1979; Fisher, 1983) emotional overlays may interfere with students' internalizing information about sensitive topics. An additional problem may be the belief that 'it won't happen to me'. These seem to be the more difficult aspects of AIDS prevention in terms of public education. Consequently, schools implementing such programs may need to place strong emphasis on counseling as a part of instruction. Teacher reaction to the initial implementation of this program seems to demonstrate a need to allocate more time. Pretest information should be used, each time AIDS prevention is taught, with the goal of customizing instruction, (Scott et al., 1988) and posttest information should be analyzed immediately following instruction so that teachers have opportunity to clear up misunderstandings. All teachers, whether they teach AIDS prevention or not, need to increase their knowledge and comfort with the subject (Raper and Aldridge, 1988; Hinch, 1988).

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TABLE 1

Percentage of Students Mastering Each Objective on Pretest and Posttest

	YOUNG N=1683 (59%)		MID N=1308 (26%)		HIGH N=2032 (32%)		GRADE 8 N=982 (40%)		GRADE 10 N=1140 (50%)	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
Define AIDS	9%	72%	20%	79%	53%	78%	31%	76%	15%	39%
Identify Causes	55%	83%	68%	86%	77%	86%	80%	87%	44%	80%
Means Of Transmission	63%	71%	77%	87%	84%	88%	38%	40%	44%	50%
Methods of Prevention	69%	71%	74%	80%	84%	86%	28%	63%	42%	61%
High Risk Groups							50%	68%	33%	45%
Recognize Misconceptions	34%	54%	48%	70%	66%	73%	26%	42%	22%	36%
Know History and Origins							18%	52%	1%	14%
Form of AIDS									37%	55%
Test for AIDS									23%	43%
Effect on Pregnancy									56%	72%
Authoritative Sources of Information							61%	70%	59%	73%
Group $\bar{x}$	46.0	70.2	57.4	80.4	72.8	82.2	41.5	62.3	34.2	51.7
Group S.D.	21.9	9.3	21.3	6.1	11.8	5.7	19.5	15.4	16.8	18.4

Table 2

Questions which Fewer Eighth Grade Students Answered Correctly on Posttest

	Pre	Post
Children with AIDS are likely to have a) an older brother with AIDS, b) been born with AIDS, c) received contaminated blood transfusions, d) either b or c	74%	65%
Nearly all persons with the AIDS virus who do not develop AIDS suffer other severe medical conditions (true, false)	61%	27%
Persons with AIDS may get severe illnesses not acquired by others (true, false)	78%	73%
Women have a greater immunity to AIDS than men (true, false)	63%	62%
AIDS cannot be transmitted from women to men (true, false)	79%	76%
The AIDS virus is contageous, but cannot be spread in the same manner as the common cold, measles, or chicken pox (true, false)	72%	49%
Every child born of a woman with the AIDS virus acquires the virus during or after birth (true, false)	27%	25%